

CLAIMS

I claim:

1. A beverage dispensing nozzle, comprising:
a body including a syrup inlet port, a syrup discharge port, and a syrup flowpath therebetween;
the body further including a mixing fluid inlet port, a mixing fluid outlet port, and a mixing fluid channel disposed around the syrup flowpath; and
at least one flow director disposed within the mixing fluid channel.
2. The beverage dispensing nozzle of claim 1, wherein the at least one flow director increases the velocity of the exiting mixing fluid.
3. The beverage dispensing nozzle according to claim 1, further comprising multiple flow directors that segment a lower portion of the mixing fluid channel into flow director channels.
4. The beverage dispensing nozzle of claim 3, wherein the multiple flow directors increase the velocity of the mixing fluid.
5. The beverage dispensing nozzle of claim 3, wherein the mixing fluid inlet port delivers mixing fluid to the flow director channels.
6. The beverage dispensing nozzle according to claim 1, wherein the beverage syrup exits in an annular discharge.
7. The beverage dispensing nozzle according to claim 1, wherein the body includes an inwardly extending lip portion for directing inward the flow of mixing fluid exiting the beverage dispensing nozzle.
8. The beverage dispensing nozzle of claim 1, wherein the body further comprises a flavor additive inlet port coupled to a flavor additive source, wherein the flavor additive inlet port

communicates flavor additive to a flavor additive passageway of the body, wherein the body further comprises a flavor additive outlet port connected with the flavor additive inlet port, wherein the flavor additive passageway communicates flavor additive to the flavor additive outlet port of the body for discharge from the beverage dispensing nozzle.

9. The beverage dispensing nozzle of claim 1, wherein at least one flow director segments the mixing fluid stream, and provides the mixing fluid with an increased downward velocity component.

10. The beverage dispensing nozzle of claim 9, wherein the increased velocity component overcomes the surface tension of the mixing fluid, therein preventing intermingling between the mixing fluid and the syrup discharge ports.

11. The beverage dispensing nozzle of claim 1, wherein at least one flow director segments the mixing fluid and prevents training of the exiting mixing fluid to one end of the beverage dispensing nozzle.

12. A method of forming a beverage drink utilizing a beverage dispensing nozzle, comprising:

delivering a beverage syrup to a syrup inlet port of the beverage dispensing nozzle;

delivering a mixing fluid to a mixing fluid inlet port of the beverage dispensing nozzle;

delivering the beverage syrup from the syrup inlet port to a discharge port via a syrup flowpath disposed in the nozzle;

delivering the mixing fluid from the mixing fluid inlet port to a mixing fluid channel surrounding the syrup flowpath;

discharging the beverage syrup from the discharge port;

increasing the velocity of the mixing fluid in the mixing fluid channel; and

discharging the mixing fluid from the beverage dispensing nozzle to contact exiting beverage syrup to mix therewith outside of the beverage dispensing nozzle.

13. The method of forming a beverage drink utilizing a beverage dispensing nozzle according to claim 12, wherein at least one flow director increases the velocity of the mixing fluid in the mixing fluid channel.

14. A beverage dispensing nozzle, comprising:

a cap member comprising a first beverage syrup inlet port coupled to a first beverage syrup source and a mixing fluid inlet port coupled to a mixing fluid source;

an inner housing coupled to the cap member, wherein the inner housing defines a chamber;

a first annulus disposed within the chamber of the inner housing, the first annulus and the inner housing defining a first beverage syrup channel, wherein the first beverage syrup inlet port communicates beverage syrup to the first beverage syrup channel for discharge from the beverage dispensing nozzle; and

an outer housing coupled to the cap member, the outer housing and the inner housing defining a mixing fluid channel, wherein a lower portion of the mixing fluid channel is segmented by at least one flow director, therein creating at least one flow director channel, wherein the mixing fluid inlet port communicates mixing fluid to the mixing fluid channel and through the flow director channel for discharge from the beverage dispensing nozzle in a flow pattern surrounding the exiting beverage syrup to mix therewith outside the beverage dispensing nozzle.

15. The beverage dispensing nozzle according to claim 14, wherein the inner housing includes a first cavity therein connected with a first inner housing conduit that communicates with the first beverage syrup channel.
16. The beverage dispensing nozzle according to claim 15, wherein the cap member comprises a first beverage syrup outlet port connected with the first beverage syrup inlet port, wherein the first beverage syrup outlet port fits within the first cavity of the inner housing to couple the inner housing to the cap member and to communicate beverage syrup to the inner housing.
17. The beverage dispensing nozzle according to claim 14, wherein the cap member comprises a plurality of mixing fluid outlet channels connected to the mixing fluid inlet port and communicating with the mixing fluid channel for circumferentially delivering mixing fluid into the mixing fluid channel.
18. The beverage dispensing nozzle according to claim 14, wherein the cap member comprises a conduit connected to the mixing fluid inlet port and communicates with the inner housing for delivering mixing fluid through the center of the beverage dispensing nozzle.
19. The beverage dispensing nozzle according to claim 18, wherein a diffuser resides within the conduit for delivering mixing fluid through the center of the beverage dispensing nozzle.
20. The beverage dispensing nozzle according to claim 14, wherein the first annulus comprises a discharge member that restricts the flow pattern of the beverage syrup exiting the beverage dispensing nozzle to insure a uniform distribution.
21. The beverage dispensing nozzle according to claim 20, wherein the discharge member includes a plurality of discharge channels that aid the first beverage syrup channel in discharging the beverage syrup from the beverage dispensing nozzle.

22. The beverage dispensing nozzle according to claim 14, wherein the outer housing includes an inwardly extending lip portion for directing inward the flow of mixing fluid exiting the beverage dispensing nozzle.

23. A beverage dispensing nozzle, comprising:

a cap member comprising a first beverage syrup inlet port coupled to a first beverage syrup source, a second beverage syrup inlet port coupled to a second beverage syrup source, and a mixing fluid inlet port coupled to a mixing fluid source;

an inner housing coupled to the cap member, wherein the inner housing defines a chamber;

a first annulus disposed within the chamber of the inner housing, the first annulus and the inner housing defining a first beverage syrup channel, wherein the first beverage syrup inlet port communicates beverage syrup to the first beverage syrup channel for discharge from the beverage dispensing nozzle;

a second annulus disposed within the chamber of the inner housing, the second annulus and the first annulus defining a second beverage syrup channel, wherein the second beverage syrup inlet port communicates beverage syrup to the second beverage syrup channel for discharge from the beverage dispensing nozzle; and

an outer housing coupled to the cap member, the outer housing and the inner housing defining a mixing fluid channel, wherein a lower portion of the mixing fluid channel is segmented by at least one flow director, therein creating at least one flow director channel; wherein the mixing fluid inlet port communicates mixing fluid to the mixing fluid channel and through the flow director channel for discharge from the beverage dispensing nozzle and mixing with exiting beverage syrup.

24. The beverage dispensing nozzle according to claim 23, wherein the inner housing includes a first cavity therein connected with a first inner housing conduit that communicates with the first beverage syrup channel.
25. The beverage dispensing nozzle according to claim 24, wherein the cap member comprises a first beverage syrup outlet port connected with the first beverage syrup inlet port, wherein the first beverage syrup outlet port fits within the first cavity of the inner housing to couple the inner housing to the cap member and to communicate beverage syrup to the inner housing.
26. The beverage dispensing nozzle according to claim 23, wherein the cap member comprises a plurality of mixing fluid outlet channels connected to the mixing fluid inlet port and communicating with the mixing fluid channel for circumferentially delivering mixing fluid into the mixing fluid channel.
27. The beverage dispensing nozzle according to claim 23, wherein the outer housing includes an inwardly extending lip portion for directing inward the flow of mixing fluid exiting the beverage dispensing nozzle.
28. The beverage dispensing nozzle according to claim 23, wherein the inner housing includes a second cavity therein connected with a second inner housing conduit that communicates with the second beverage syrup channel.
29. The beverage dispensing nozzle according to claim 28, wherein the cap member further comprises a second beverage syrup outlet port connected with the second beverage inlet port, wherein the second beverage syrup outlet port fits within the second cavity of the inner housing to couple the inner housing to the cap member and to communicate beverage syrup to the inner housing.

30. The beverage dispensing nozzle according to claim 23, wherein the cap member further comprises a third beverage syrup inlet port coupled to a third beverage syrup source.
31. The beverage dispensing nozzle according to claim 30, further comprising a third annulus disposed within the chamber of the inner housing, the third annulus and the second annulus defining a third beverage syrup channel, wherein the third beverage syrup inlet port communicates beverage syrup to the third beverage syrup channel for discharge from the beverage dispensing nozzle.
32. The beverage dispensing nozzle according to claim 31, wherein the inner housing includes a third cavity therein connected with a third inner housing conduit that communicates with the third beverage syrup channel.
33. The beverage dispensing nozzle according to claim 32, wherein the cap member further comprises a third beverage syrup outlet port connected with the third beverage syrup inlet port, wherein the third beverage syrup outlet port fits within the third cavity of the inner housing to couple the inner housing to the cap member and to communicate beverage syrup to the inner housing.
34. The beverage dispensing nozzle according to claim 31, wherein the third annulus comprises a discharge member that restricts the annular flow pattern of the beverage syrup exiting the beverage dispensing nozzle to insure a uniform distribution.
35. The beverage dispensing nozzle according to claim 34, wherein the discharge member includes a plurality of discharge channels that aid the third beverage syrup channel in discharging the beverage syrup from the beverage dispensing nozzle.
36. A method of forming a beverage drink utilizing a beverage dispensing nozzle comprising:
delivering a beverage syrup to a first beverage syrup inlet port of a cap member;

delivering a mixing fluid to a mixing fluid inlet port of the cap member;

delivering the beverage syrup from the first beverage syrup inlet port to a first beverage syrup channel defined by an inner housing coupled with the cap member and a first annulus disposed in the inner housing;

delivering the mixing fluid from the mixing fluid inlet port to a mixing fluid channel;

discharging the beverage syrup from the first beverage syrup channel;

increasing the velocity of the mixing fluid in the mixing fluid channel; and

discharging the mixing fluid from the mixing fluid channel in a pattern that contacts exiting beverage syrup to mix therewith outside the beverage dispensing nozzle.

37. The method of forming a beverage drink utilizing a beverage dispensing nozzle according to claim 36, wherein the mixing fluid velocity is increased through the use of at least one flow director.

38. The method of forming a beverage drink utilizing a beverage dispensing nozzle according to claim 36, further comprising:

delivering a beverage syrup to a second beverage syrup inlet port of the cap member;

delivering the beverage syrup from the second beverage syrup inlet port to a second channel defined by a second annulus disposed in the inner housing and the first annulus; and

discharging the beverage syrup from the second beverage syrup channel,

39. The method of forming a beverage drink utilizing a beverage dispensing nozzle according to claim 38, further comprising:

delivering a beverage syrup to a third beverage syrup inlet port of the cap member;

delivering the beverage syrup from the third beverage syrup inlet port to a third beverage syrup channel defined by a third annulus disposed in the inner housing and the second annulus;
and

discharging the beverage syrup from the third beverage syrup channel.

40. The method of forming a beverage drink utilizing a beverage dispensing nozzle according to claim 36, further comprising:

delivering a flavor additive to a flavor additive inlet port of the cap member;

delivering the flavor additive from the flavor additive inlet port to a flavor additive passageway within the first annulus.

discharging the flavor additive from the first annulus.

41. A method of forming a beverage drink utilizing a beverage dispensing nozzle comprising:

delivering a beverage syrup to a first beverage syrup inlet port of a cap member;

delivering a mixing fluid to a mixing fluid inlet port of the cap member;

delivering the beverage syrup from the first beverage syrup inlet port to a first beverage syrup channel defined by an inner housing coupled with the cap member and a first annulus disposed in the inner housing;

discharging the beverage syrup from the first beverage syrup channel;

delivering the mixing fluid from the mixing fluid inlet port to a mixing fluid channel;

increasing the velocity of the mixing fluid in the mixing fluid channel; and

discharging the mixing fluid from the mixing fluid channel and through the flow directors for mixing with beverage syrup.

42. The method of forming a beverage drink utilizing a beverage dispensing nozzle according to claim 41, further comprising:

delivering a beverage syrup to a second beverage syrup inlet port of the cap member;
delivering the beverage syrup from the second beverage syrup inlet port to a second beverage syrup channel defined by second annulus disposed in the inner housing and the first annulus; and

discharging the beverage syrup from the second beverage syrup channel.

43. The method of forming a beverage drink according to claim 41, wherein the velocity of the mixing fluid is increased through the use of at least one flow directors.

44. A method of forming a beverage drink utilizing a beverage dispensing nozzle comprising:

delivering a beverage syrup to a first beverage syrup inlet port of a cap member;
delivering a beverage syrup to a second beverage syrup inlet port of the cap member;
delivering a mixing fluid to a mixing fluid inlet port of the cap member;
delivering the beverage syrup from the first beverage syrup inlet port to a first beverage syrup channel defined by an inner housing coupled with the cap member and a first annulus disposed in the inner housing;

discharging the beverage syrup from the first beverage syrup channel;

delivering the beverage syrup from the second beverage syrup inlet port to a second beverage syrup channel defined by a second annulus disposed in the inner housing and the first annulus;

discharging the beverage syrup from the second beverage syrup channel;

delivering the mixing fluid from the mixing fluid inlet port to a mixing fluid channel;

increasing the velocity of the mixing fluid in the mixing fluid channel; and

discharging the mixing fluid from the mixing fluid channel for mixing with exiting beverage syrup.

45. The method of forming a beverage drink utilizing a beverage dispensing nozzle according to claim 44, further comprising:

delivering a beverage syrup to a third beverage syrup inlet port of the cap member;

delivering the beverage syrup from the third beverage syrup inlet port to a third beverage syrup channel defined by a third annulus disposed in the inner housing and the second annulus;
and

discharging the beverage syrup from the third beverage syrup channel.

46. The method of forming a beverage drink according to claim 44, wherein the velocity of the mixing fluid is increased through the use of flow directors.